

Idaho National Laboratory:

*Join the Energy
Renaissance*



Expanding the frontiers of science

Idaho National Laboratory is one of the largest employers of scientists and engineers in the region.

For 60 years, our researchers have been quietly at work, expanding the frontiers of science in areas as diverse as energy supply and national security. From generating the world’s first usable amount of electricity from nuclear power to developing breakthrough technologies to detect hidden explosives, treat cancer, remove arsenic from drinking water and make plant wastes usable as an energy source, the scientists and engineers of INL put pioneering science to work to solve real problems for real people.

You, too, could become part of the next generation of contributors putting science and engineering to work at Idaho National Laboratory.



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Idaho National Laboratory – *Creating the future*

Idaho National Laboratory is one of the U.S. Department of Energy's multiprogram national laboratories. With about 4,000 scientists, researchers and support staff, the laboratory works with national and international governments, universities and industry partners to discover new science and develop technologies that underpin the nation's nuclear and renewable energy, national security and environmental missions. Its core competencies, highlighted here, reflect more than a half century of nuclear energy development and decades of experience in basic and applied science research and applied engineering. These core capabilities form the foundation of INL research initiatives and key capabilities today.

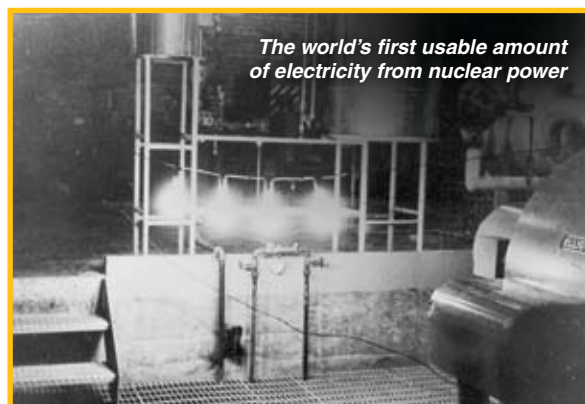
Research, Development and Demonstration

INL has an experienced engineering and technical work force to develop, model, test, demonstrate and validate a variety of engineered systems and

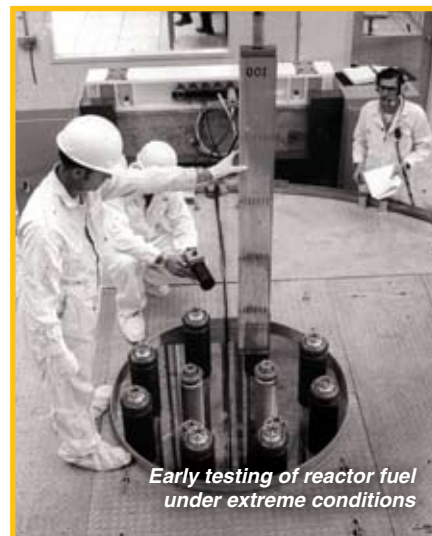
processes to solve specific Department of Energy and industry-related environmental and energy-efficiency challenges involved with, among other areas, fossil energy and hydrogen production and use – including materials science, plasma technologies, biotechnology and alternate fuel transportation systems.

Basic and Applied Science Research

The scientific reputation and credentials of INL researchers play a key role in accomplishing research activities, including earth sciences and environmental engineering, biotechnology, physical systems modeling, systems engineering, intelligent automation and remote systems, applied engineering, materials processing, chemical separations and processing, sensing and diagnostics, neutron capture therapy, surface ionization mass spectrometry and fusion safety.



The world's first usable amount of electricity from nuclear power



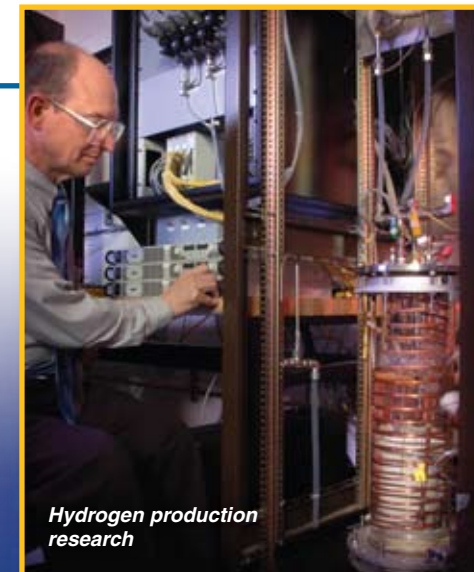
Early testing of reactor fuel under extreme conditions



Hot cells maintained at several INL facilities



Installation of the unique Advanced Test Reactor



Hydrogen production research

The Cerenkov effect in the Advanced Test Reactor

Nuclear Science and Technology – *Developing a crucial energy resource*

Idaho National Laboratory is designated as the nation's lead laboratory for nuclear energy research and development because of its unique history, infrastructure, expertise and partnerships. The nation's confidence in the laboratory has brought major U.S. nuclear energy development programs to INL.

The recent establishment of INL's Advanced Test Reactor (ATR) as a National Scientific User Facility helps reassert U.S. leadership in nuclear science and technology, and makes it easier for new users - universities, laboratories and industry - to conduct research at the ATR.

INL's research initiatives include:

Advanced Fuel Cycle Initiative

Researchers at INL are pursuing the Advanced Fuel Cycle Initiative's goal of developing fuel cycle technologies that will meet the need for economic and sustained nuclear energy production. AFCI technologies focus on R&D to support the operation of current nuclear power plants, Generation III+ advanced light water reactors and Generation IV advanced reactors. The systems and processes under research and development as part of AFCI should enable a significant reduction in the amount of high-level radioactive waste requiring geologic disposal, reduced accumulation of plutonium in civilian spent fuel and the extraction of more useful energy from nuclear fuel.

Generation IV Nuclear Power (Gen IV)

INL is an active participant in Gen IV nuclear systems research, working with industry,

universities, other labs and overseas organizations in an effort to develop and deploy promising, advanced, next-generation reactor technologies by 2030.

Nuclear Hydrogen

Scientists at INL have made important breakthroughs required for the future, large-scale production of hydrogen. High-temperature electrolysis has the potential of enabling the efficient mass production of hydrogen. The goal is to use nuclear energy to create hydrogen, as part of a multifaceted effort to reduce the nation's demand for oil.

Radioisotope Power Systems and Space Technologies

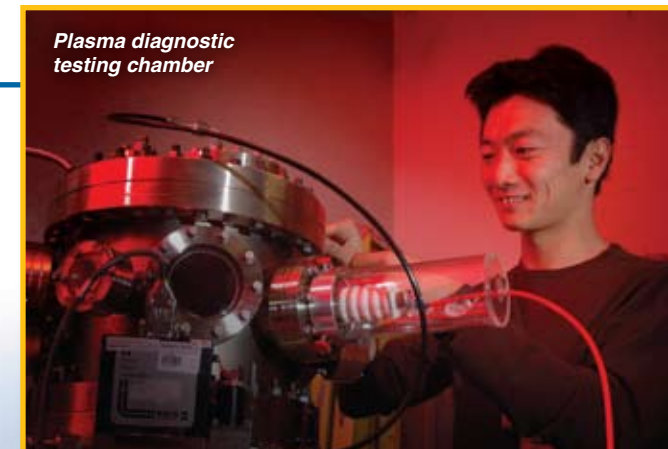
Radioisotope power systems are used to provide heat and electricity for space exploration missions and select military applications. INL assembled a radioisotope thermoelectric generator (RTG) for the New Horizons mission to Pluto in 2005, and has been assigned the final assembly and testing of the RTG for the project scheduled for a land rover mission to Mars. Preparations are also under way for the potential future production of lunar surface power reactors.

Medical Applications

INL is helping develop boron neutron capture therapy techniques to treat cancer and alleviate pain, and also has the capability of producing isotopes to power highly specialized radiosurgery devices.



Fuel fabrication and development



Plasma diagnostic testing chamber



Collaborative multiphysics nuclear engineering (Steve Owen, SNL)

Illustration of the Advanced Test Reactor core

National and Homeland Security – Protecting our nation and saving lives

Since its inception in 1949, Idaho National Laboratory has created products and developed solutions that are saving lives from the home front to the battlefield. Today, the laboratory's national and homeland security objectives continue. Recent national and international events – from the global war on terror to the threat of nuclear weapons – have led INL to formulate four national and homeland security mission areas including:

Critical Infrastructure Protection

INL researchers are internationally recognized for our ability to improve physical and cybersecurity operations for the nation's critical infrastructures. Our concentrated efforts and expertise include programs in electric grid reliability, process controls and SCADA systems, cybersecurity and wireless communication systems.

Nuclear Nonproliferation

INL engineers develop advanced nuclear detection technologies, design proliferation-resistant fuels, conduct first responder training and lead numerous coordination and policy efforts to prevent the illicit production, acquisition and transport of nuclear materials. Our expertise and nuclear research facilities create an unmatched location for securing the nuclear fuel cycle and meeting the challenges and demands for safe reactor operations.

Defense Systems and Technology

Safeguarding our soldiers involved in global conflicts requires innovative solutions that meet and exceed the challenges faced in modern warfare.

INL has a long history of supporting our service men and women through the development of advanced personnel and tank armor, explosives detection technologies, unmanned robotics systems and chemical demilitarization technology.

Special Programs

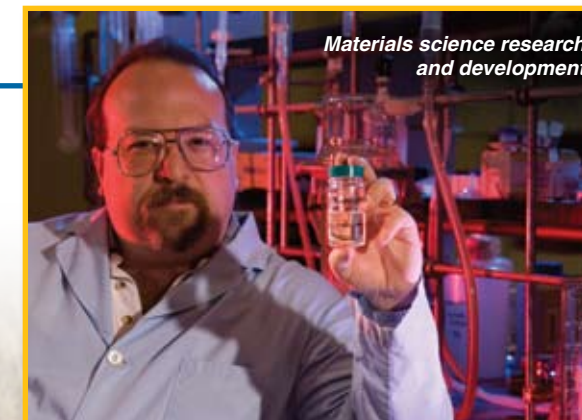
INL engineers are recognized experts in developing and testing advanced materials, sensors and specialty products for national security operations. We provide customers within the Department of Defense and other federal agencies with essential information analysis and operational support.



*Nuclear materials
detection technology*



*Critical infrastructure
and communications
testing facilities*



*Materials science research
and development*



*Commercial robot platforms with
autonomous decision-making capabilities*

Energy and Environment – Solving complex problems

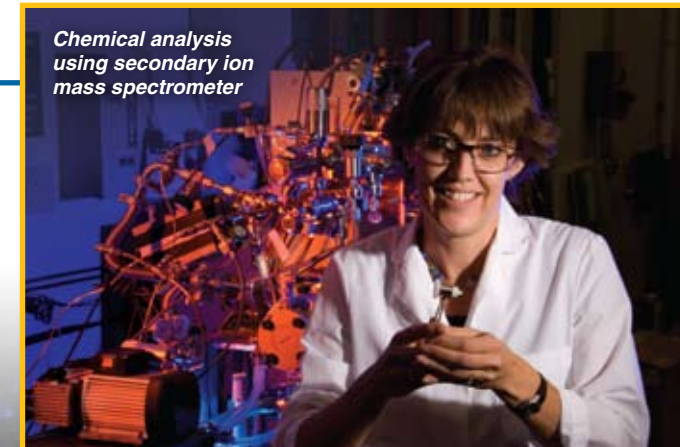
The Energy and Environment Science and Technology directorate's award-winning researchers address many of the nation's most pressing issues such as uncertainties about energy production and capacity, energy security and environmental impacts, development of clean, safe and secure energy resources — including the rebirth of nuclear energy — and integration of energy development with water management and environmental protections. This research is organized into:

Energy Systems & Technologies – embodies science and engineering functions related to clean, safe and secure energy resource development and carbon management; efficient use of fossil and renewable energy systems; conversion of coal-to-liquid and biofuel technologies; advanced vehicle testing and transportation technologies; virtual and computational engineering, modeling and simulation; and systems integration.

Environmental & Natural Resource Management – guides development strategies for energy/water development and use; prescribes management of hazardous and radioactive materials, and researches methods to assure that by-products and wastes from nuclear and nonnuclear energy development can be safely minimized, treated, stored, transported and disposed of; and preserves the nation's ability to safely produce and use energy resources.

Science & Engineering – discovers the composition, properties, structures, energy and reactions of known and unknown substances; develops synthetic polymers; fabricates and tests struc-

tural materials and welding technologies; devises measurement systems and noncontact sensors; captures and uses organisms living in extreme environments; increases knowledge and understanding of chemical, biological and geophysical processes in subsurface environments; and innovates autonomous robotic/human systems.



INL Facilities – *The places of progress*

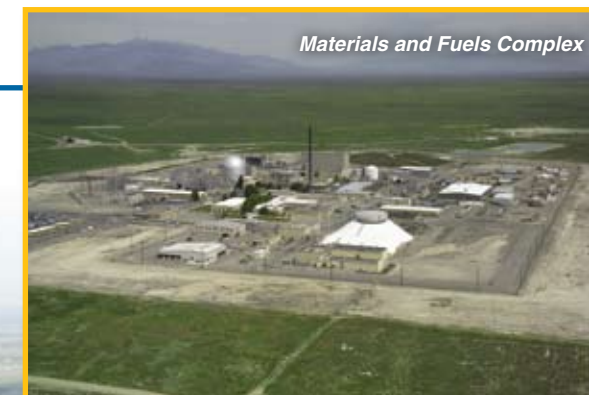
INL's unique physical assets allow it to be an international leader in nuclear energy technology research and development. The laboratory has multiple facility areas:

The **Advanced Test Reactor Complex** is dedicated to research supporting Department of Energy missions, including nuclear technology research. It includes the Advanced Test Reactor-Critical Facility, Hot Cell Facility, Radiation Measurements Laboratory, Radiochemistry Laboratory, and Safety and Tritium Applied Research Facility.

Materials and Fuels Complex is a prime testing center for advanced technologies associated with nuclear power systems. This complex includes the Hot Fuel Examination, Fuel Conditioning, and Fuel Manufacturing facilities.

Research and Education Campus is the collective name for INL's administrative, technical support and computer facilities in Idaho Falls, as well as the in-town laboratories where researchers work on a wide variety of advanced scientific research and development projects.

A key energy research facility in Idaho Falls is the Center for Advanced Energy Studies. It is designed to promote education and world-class research and development by integrating resources, capabilities and expertise to produce secure, sustainable energy solutions.



Part of the Research and Education Campus

Career Opportunities – Join the energy renaissance

Idaho National Laboratory recognizes the value of fresh ideas and perspectives.

Opportunities exist in fields as diverse as:

- Accounting & Finance
- Biology
- Chemical Engineering
- Chemistry
- Computer Engineering
- Computer Science
- Cyber Security
- Electrical Engineering
- Geosciences
- Life and Earth Sciences
- Mechanical Engineering
- Materials Science
- Nuclear Engineering
- Physics
- Research
- Telecommunications

It's easy to let us know you'd like to find out more about starting a career at Idaho National Laboratory:

- Go to <http://www.inl.gov/careers/>.
- Find a position you're interested in.
- Create your Candidate Profile.
- Attach your Candidate Profile to the posting of interest.
- Submit your information for consideration.

For more information about Idaho National Laboratory, visit www.inl.gov.

For specific career inquiries, contact any of our recruiting staff. Or, contact the INL careers hot line at (208) 526-5888.

Thomas Steele – *Nuclear S&T recruiter*,
Thomas.Steele@inl.gov

Vanessa Van Dyk – *National & Homeland Security recruiter*, Vanessa.VanDyk@inl.gov

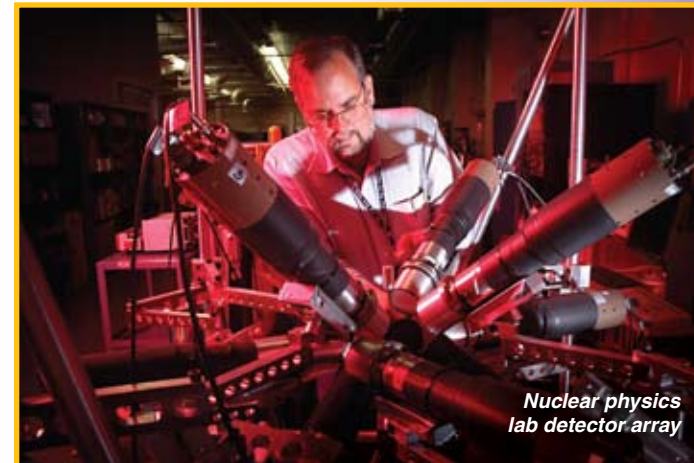
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Multifaceted research



Nuclear physics lab detector array



Project collaboration



Research into biomass conversion rates

Internship Programs – *Get started now*

Internship Programs accommodate undergraduate and graduate students.

All internship participants are brought to the laboratory as INL temporary employees. Requirements for student interns include:

1. Full-time enrollment at an accredited college or university.
2. Minimum cumulative GPA of 3.0.

Foreign National Students are eligible for internships if they attend an accredited U.S. university or college and have a Curricular Practical Training authorization from the university holding the student's current visa. Foreign national students must meet the requirements listed above.

Internship Opportunities Include:

Graduate Internships – offer full- or part-time research experience at INL or on the campus of a college or university.

Undergraduate Internships – is a summer program that offers 10 to 16 weeks of full-time research experience at INL with an INL mentor, or on a college or university campus under the supervision of a faculty researcher during an academic semester.

Academic Visitors Program – serves faculty, students and educational institutions to support a hands-on educational work experience at INL. Participants are required to have an INL sponsor and

approval from their respective university or educational institution through a letter of agreement.

Postdoctoral Internship Program – is in collaboration with the Administration of Professional and Scientific Personnel at Washington State University. INL postdoctoral interns are given faculty status at WSU and assigned work at INL.

International Research Associates Program – was created so that faculty, scientists and researchers who are not citizens or permanent residents of the United States can come to INL and collaborate with INL research personnel under any of the programs described in this brochure.



Hands-on
lab experience



Interactive learning
with colleagues



Training under the
guidance of mentors

Please visit our Web sites at www.inl.gov/education for more information on Internship Programs.



Unique skill
development

A Great Place to Live – *One of the nation's best kept secrets*

The area is one of the fastest growing technical environments in the nation and has the largest concentration of technical professionals in the northern Rocky Mountain region. Approximately 15 percent of workers in the area are in the high-technology industry, compared to the national average of just 9 percent.

Idaho Falls, which prides itself on a small-town friendly atmosphere, was recently named the tenth most secure place to live among American small towns and second for its low cost of living.

Idaho Falls has unmatched recreational opportunities. The area is in the heart of some of the best outdoor recreation areas in the world, with access to Yellowstone National Park, Grand Teton National Park, Craters of the Moon National Monument, Sun Valley, scenic Shoshone Falls, Jackson Hole, Salt Lake City and areas of Nevada, to name a few.



Historic home in Idaho Falls



The Center for Higher Education



Upper Mesa Falls



The greenbelt along the Snake River



INL is one of the U.S. Department of Energy's
multiprogram national laboratories and is managed
by Battelle Energy Alliance, LLC.